



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

HLA

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,214	11/20/2003	Behnam Moradi	303.591US2	3196
21186	7590	08/22/2006	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			GUHARAY, KARABI	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/719,214	<b>Applicant(s)</b> MORADI ET AL.	
	<b>Examiner</b> Karabi Guharay	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on RCE, filed on 11 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-24 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/3/06</u> . | 6) <input type="checkbox"/> Other: _____  |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11 July 2006 has been entered.

Applicant's Remark, filed on 3 July 2006 has been considered and entered.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-6, 11-21, 23-24 & 26 rejected under 35 U.S.C. 102(b) as being anticipated by Doan et al. (US 5372973).

Regarding claims 1, 11-18, & 26, Doan et al. disclose a field emitter display device (see Fig 1), used for video image (computer monitor), array of field emission devices (lines 30-32 of column 1) comprising at least one emitter (13) comprising silicon (lines 10-14 of col. 3) having a coating embedded insubstantially the entirety of the surface of the at least one emitter (13, lines 34-40 of column 6) that releases electrons at a predetermined energy level, and a light emitting target comprising phosphor

(phosphor layer of Fig 1) that radiates when the released electrons strike the light emitting target.

Doan et al. are silent regarding the limitations of "the coating acting in the presence of out-gassing to inhibit degradation of the at least one emitter, the out-gassing including organic matter".

However, the Examiner notes that the reference discloses each and every claimed structural limitation with the recited coating material. The functions of inhibiting degradation of the emitter in the presence of out-gassing are consequential of the properties of the coating material and "products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable." See MPEP 21 12.01. Accordingly, these functional limitations are inherently possessed by the coating material of Doan et al.

The Examiner further notes that etching and patterning an emitter layer form the emitters comprising silicon. As is well known in the manufacture of emitters, an etching process leaves a roughened surface with micro-pores formed at the etched surface. Hence, the coating deposited over the emitter is formed at said roughened surface and micro-pores. That is, the coating is embedded in the surface of the emitter.

Claims 2-3 are rejected over the reasons in claim 1.

Regarding claims 5-6, Doan et al. disclose that the coating material is a silicide compound (barium, chromium silicide) and also disclose that the coating material is a metal nitride (Cesium, rubidium, tantalum nitride, lines 34-40 of column 6).

Referring to claims 19-21, the claims are rejected over the reasons stated in the rejection of claim 18.

Regarding claims 23-24, Doan et al. disclose that the video display being a flat panel display (Col 1, lines 27-32).

Claims 1, 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Koga et al. (US 5,925,891).

In regards to claim 1, Koga discloses a field emitter display device (see at least Figs. 1(a) and 5(a) ), comprising, at least one emitter 17 comprising silicon having a coating 20 (23) comprising TiN (see at least Col. 10, lines 55-61) embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, further Koga teaches that the coating acting in the presence of out-gassing to inhibit degradation of the at least one emitter (lines 36-51 of column 18).

The Examiner further notes that etching and patterning an emitter layer form the emitters comprising silicon (see Fig 18b), and discloses coating on this porous surface, hence the coating is embedded in the surface of the emitter.

In regards to claims 4 & 6, Koga discloses that the coating material is TiN (see at least Col. 10, lines 55-61). Koga discloses the same material as the applicant thus coating will act in the presence of organic matters to inhibit degradation of the emitter, since "products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable."

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doan et al. (US 5372973) as applied to claim 1 above, and further in view of Takemura (US 5666020).

Regarding claims 4 & 7-8, Doan et al. disclose all the limitations of claims 7-8 (see rejection of claim 1), including silicide compound such as barium, chromium silicide, instead of claimed platinum silicide, or titanium silicide.

However, Takemura teaches that platinum or titanium silicide is suitable materials for coating polysilicon emitter tips for reducing the work function of the emitter.

Thus it would have been obvious to one having ordinary skill in the art the time the invention was made to use platinum or titanium silicide as the coating material in the device of Doan et al., since those are suitable material for lowering the work function of the emitter.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doan et al. (US 5372973) as applied to claim 18 above, and further in view of Hush (US 5663742).

Doan et al. disclose the claimed invention except for the limitation of the video display being used as a camcorder viewfinder. However, in the same field of endeavor,

Hush discloses being used as a camcorder viewfinder. However, in the same field of endeavor, Hush discloses the suitability of field emitter devices as camcorder viewfinders (see Col. 1, lines 14-16). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the FED of Forbes in a camcorder viewfinder, since Hush discloses the suitability of said displays for camcorders.

### ***Response to Arguments***

Arguments presented in Remarks filed on 3 July 2006 are considered but they are not persuasive.

(1) Applicant contends that Doan do not suggests that the entire emitter is coated, and Applicant made an inference that Doan's method could only coat tip of emitter 13.

However, examiner respectfully disagrees, since Doan discloses that the cathode tip 13 be coated, (lines 34-35 of column 6). In this case entire emitter is called cathode tip since cathode of Doan is basically cathode 12 wherein a conical projected part 13 is formed as emitter). Further Doan suggests that cathode tip 13 is exposed and then cathode tip is coated thus means the whole structure of 13 is being coated.

In response to applicant's argument against Koga reference, examiner respectfully presents that it is not clear what applicant means by saying "Koga discloses coating which rely upon the overhang of the withdrawn electrode 19A over the insulator layers 16A and 18A. If layer 20 is continuous it would result in short circuit between adjacent cathode 17".

First of all Fig 9b clearly shows coating 20 is continuous throughout the entire emitter 17, and clearly stated that the surface of cathode 17 are coated and nowhere they state or suggest that coating should be discontinuous other wise adjacent cathodes will be short-circuited. Adjacent cathode being coated entirely by the coating is electrically isolated from the adjacent cathode since they are separated by insulating materials (18A, 16A).

Further applicant contends that "examiner's statement that "the formation of the emitter results in a roughened surface with micro-pore is not clear and is nowhere suggested in the cited reference and is clearly taught against Fig 18a and 18b".

Examiner again respectfully disagrees.

Fig 18B, clearly shows micro-pores on the surface of silicon emitter and coating are provided on this porous surface (see line 66 of column 17-line 51 of column 18).

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*K. Guharay*  
Karabi Guharay  
Primary Examiner  
Art Unit 2879  
*8/11/06*